

Claims

1. Photovoltaic module comprising an assembly of photovoltaic cells (1), arranged side by side between a front plate (2) and a rear plate (3), and a seal (4) arranged between the plates (2 and 3) and delineating a tight internal volume (5), kept at a pressure lower than atmospheric pressure, wherein the photovoltaic cells are arranged (1), module characterized in that the seal (4) is a flexible organic seal.

2. Module according to claim 1, characterized in that the seal (4) is of thermoplastic nature.

3. Module according to claim 2, characterized in that the seal (4) is a member of the polybutylene family.

4. Module according to any one of the claims 1 to 3, characterized in that it comprises a strengthening system (8) arranged around the seal (4).

5. Module according to any one of the claims 1 to 4, characterized in that, the front plate (2) being made of glass, the rear plate (3) is formed by a glass or a sheet of plastic or surface-treated metal.

6. Module according to any one of the claims 1 to 5, characterized in that the module comprises a substance (10) absorbing infrared and ultraviolet radiation and emitting a radiation in a visible spectral band corresponding substantially to the maximum of the absorption band of the photovoltaic cells (1).

7. Module according to claim 6, characterized in that the substance (10) comprises at least one material chosen from polymethyl methacrylate (PMMA),

metallic salts, compounds mainly containing mixed oxides of rare earths, of alkaline metals or of metals belonging to the alkaline earths.

5 **8.** Module according to any one of the claims 1 to 7, characterized in that it comprises interconnecting conductors (15), formed by a rigid material, connecting the photovoltaic cells (1) to one another and having a profiled shape, so as to obtain a spring effect between the photovoltaic cells (1) and the corresponding plate (2, 3).

10 **9.** Module according to claim 8, characterized in that, an interconnecting conductor (15) connecting a front face of a first cell (1a) and a rear face of an adjacent second cell (1b), a first end (16a) of the interconnecting conductor (15) is arranged between the front face of the first cell (1a) and the internal face of the front plate (2) and a second end (16b) of the interconnecting conductor (15)
15 is arranged between the rear face of the second cell (1b) and the internal face of the rear plate (3), at least one of the ends being undulating.

20 **10.** Method for production of a photovoltaic module according to any one of the claims 1 to 9, method characterized in that it comprises deposition of the organic seal (4) and that the negative pressure is formed by suction.

25 **11.** Method according to claim 10, characterized in that it successively comprises assembly of the module and, in a tight enclosure, sweeping by neutral gases, establishment of the negative pressure by suction and sealing of the front (2) and rear (3) plates by compression of the seal (4).

12. Method according to claim 10, characterized in that it successively comprises assembly and partial sealing of the module so as to leave two openings in the seal (4), sweeping by neutral gases of the internal volume by

means of the two openings, establishment of the negative pressure by suction and closing of the openings.

5 **13.** Method according to claim 10, characterized in that the negative pressure inside the tight internal volume (5) is formed, after sealing of the module, by suction by means of a perforating tool passing through the organic seal.

10 **14.** Method according to any one of the claims 10 to 13, characterized in that it comprises control of the atmosphere and of the gas composition inside the tight internal volume (5).

15 **15.** Method according to any one of the claims 10 to 14, characterized in that it comprises a compression step of the module designed to control the thickness of the module.

20 **16.** Method according to any one of the claims 10 to 15, characterized in that, before assembly of the plates (2 and 3), the photovoltaic cells (1) and interconnecting conductors (15) connecting the photovoltaic cells (1) to one another are fixed onto one of the plates (3).

25 **17.** Method according to claim 16, characterized in that, before assembly, the photovoltaic cells (1) and the interconnecting conductors (15) are fixed onto one of the plates (3) by means of a solvent-free organic glue.

30 **18.** Method according to claim 17, characterized in that the solvent-free organic glue comprises a derivative of the polyvinyl and polybutylene families.

35 **19.** Method according to any one of the claims 10 to 18, characterized in that, the front plate (2) being made of glass, the method comprises, before assembly,

a chemical treatment step of the glass front plate (2) so as to make an internal face of the glass front plate (2) rough.

5 **20.** Method according to any one of the claims 10 to 19, characterized in that, the photovoltaic cells (1) each having positive and negative poles arranged on one and the same side of the cell, the method comprises, before the cells (1) are fitted in place, deposition, on an internal face of one of the plates (3) only, of at least one metal strip (11), connecting a positive pole of a cell (1a) to a negative pole of the adjacent cell (1b) so as to connect the cells in series.

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21. Method according to claim 20, characterized in that the metal strip is formed by a strip of silver paste (11) arranged on a zone connecting locations of two adjacent cells (1a,1b).

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